

CHAMP

USU CONSORTIUM
FOR HEALTH AND
MILITARY PERFORMANCE



Bulking Up

Overview



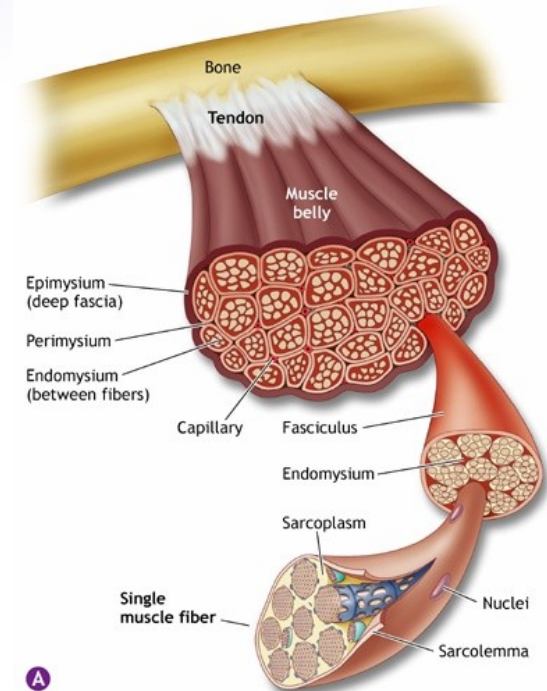
- **Benefits of strength training**
- **Determinants of muscle mass**
- **Strength training issues**
- **Dietary considerations for strength gains and performance success**
 - **Protein**
 - **Meal planning**



Benefits of Strength Training



- Increased muscle strength and endurance
- Increased muscle fiber size
- Increased ligament and tendon strength
- Greater protection against “overuse” injury

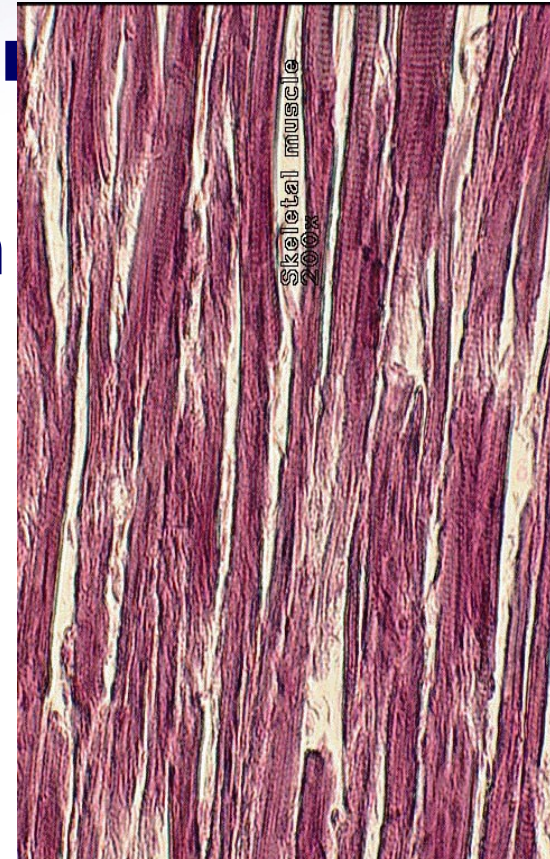


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Muscle Matters



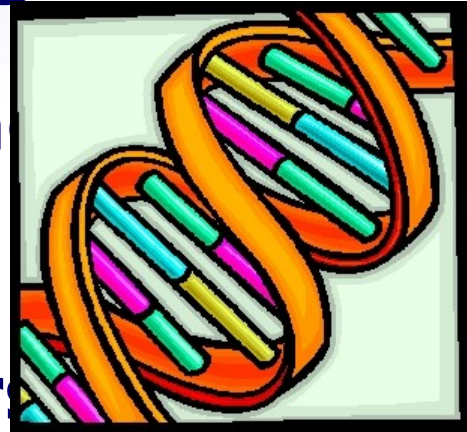
- Skeletal muscle accounts for over 50% of body weight
- Muscle mass is important in regulating metabolism
- Metabolic demands require a constant “remodeling” of muscle that is critical in maintaining quality



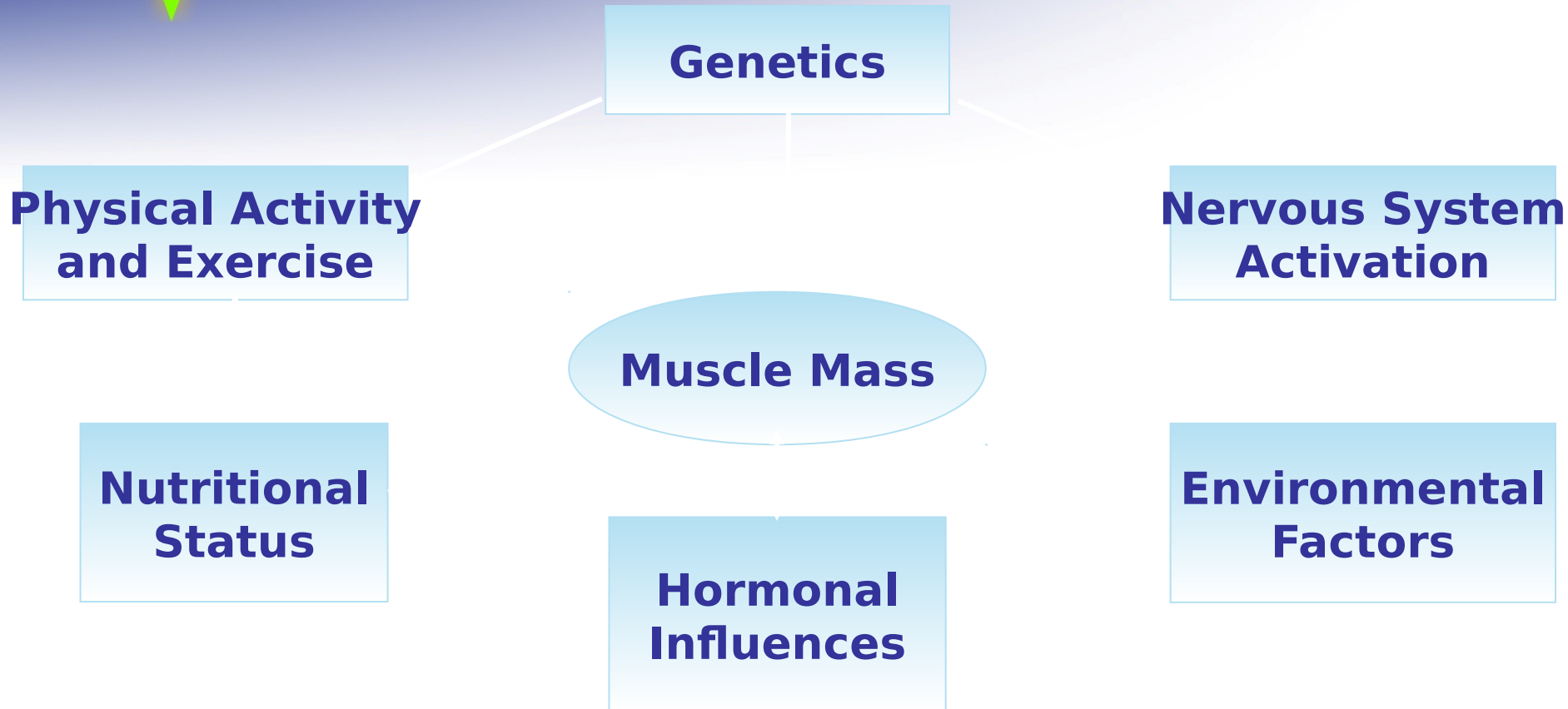
Factors Determining Muscle Mass

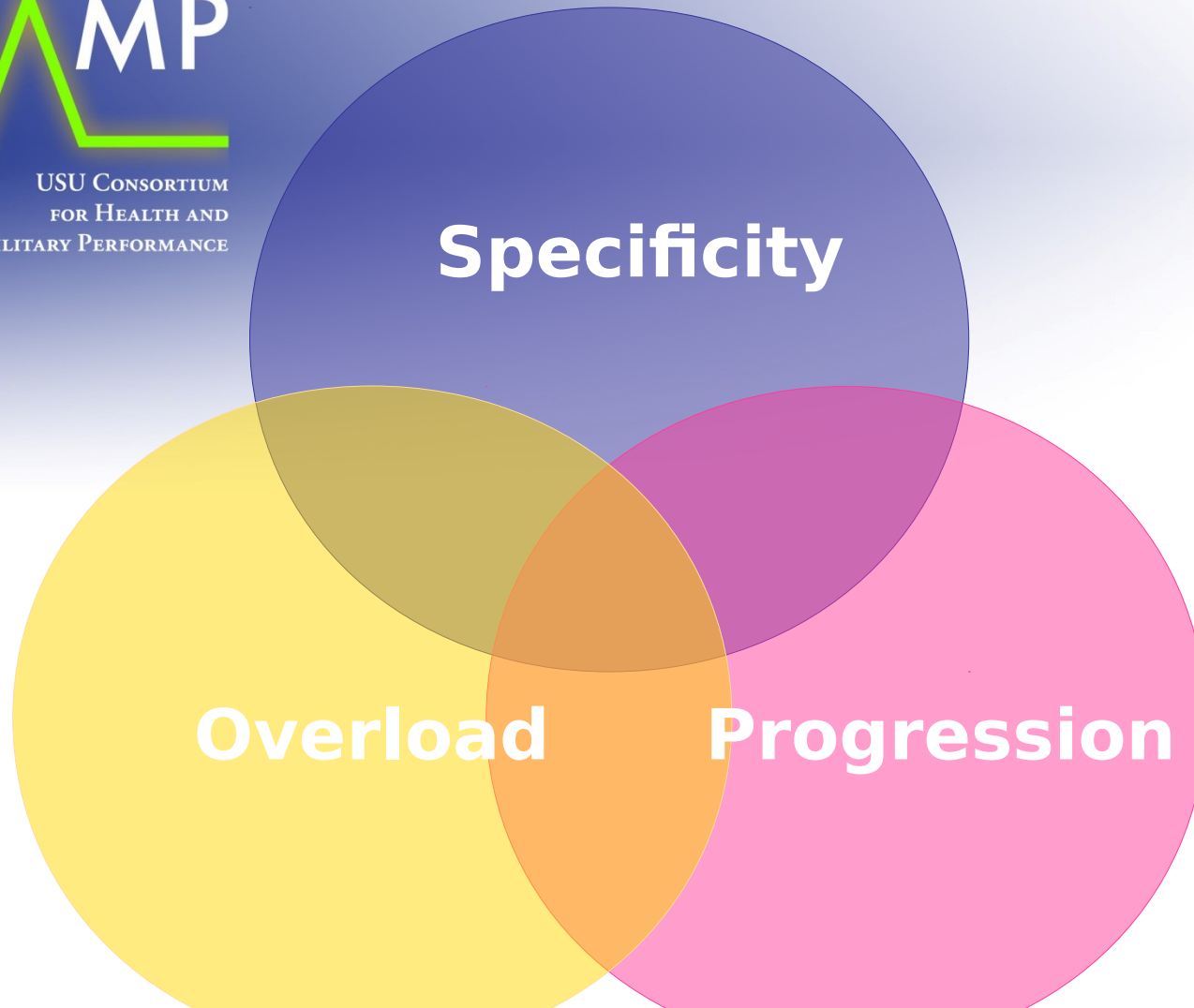


- **Intrinsic: non-controllable factors**
 - Genetic
 - Muscle fiber type
- **Extrinsic: controllable factors**
 - **Exercise:** Resistance training increases muscle mass by promoting “turnover” and re-building of structural proteins
 - **Nutritional Status:** Nutrients for muscle growth shift balance from “breaking down” to “building up”



Determinants of Muscle Mass





Principles of Training



Principles of Training



- **Specificity: Demands placed on body dictate type of neuromuscular adaptation**
- **Overload - Increasing intensity of training:**
 - Increasing number of sessions/week
 - Performing more difficult exercises
 - Adding weights or sets of exercise
 - Decreasing rest periods between exercise sets
- **Progression: Gradual increases in load or intensity**

Pitfalls to Lifting Heavy Weights



- **Lack of flexibility**
- **Potential back injury**
- **Risk of musculoskeletal injury**
- **Susceptibility to heat injury**
- **Possible muscle cramps**
- **No decrease in blood lipids**
- **May harm hypertensives when incorrect breathing is used**



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Strength Training Considerations



- **Emphasize moderate strength training, rather than “heavy” lifting**
- **Proper form and alignment are critical**
- **Individualize training program to specific goals**
- **Combine resistance and endurance exercise:**
 - **For injury prevention**
 - **For performance optimization**



Bigorexia

- **Muscle dysmorphia: an obsession about being muscular; opposite of anorexia**
- **Symptoms:**
 - Exercising when injured
 - Training compulsively each day
 - Skipping social events to exercise
 - Following a strict nutritional regimen
 - Using steroids to increase muscle mass
 - Being unhappy with one's physique
 - Spending excessive amounts on supplements





Protein Needs

- **0.6 to 0.9 grams of protein/pound body weight/day will meet all SOF daily protein requirements**
- **Protein intakes > 1.6 grams per pound/day may:**
 - **Inhibit muscle growth**
 - **Increase loss of calcium**
 - **Compromise bone health**

Calculating Your Daily Protein Needs

Enter body weight



155

lbs

Enter Activity Level



Strength



Your protein needs are between

93

g

and

140

g

Protein Quality



- **Quality of protein is more critical than dose:**
 - **2 Eggs (13 grams)**
 - **3 oz Chicken breast (18.9 grams)**
 - **3 oz Sirloin steak (23 grams)**
 - **6" Turkey Pastrami Sub (26 grams)**
 - **6" Roast Beef Sub (19 grams)**



High Protein Intake Concerns



- **High concentration of nitrogen products in urine**
 - Increases fluid requirements
 - Places considerable load on liver and kidneys
- **Hypertension**
- **Diarrhea or abdominal cramps**
- **Imbalance of essential amino acids**



Other Dietary Rules



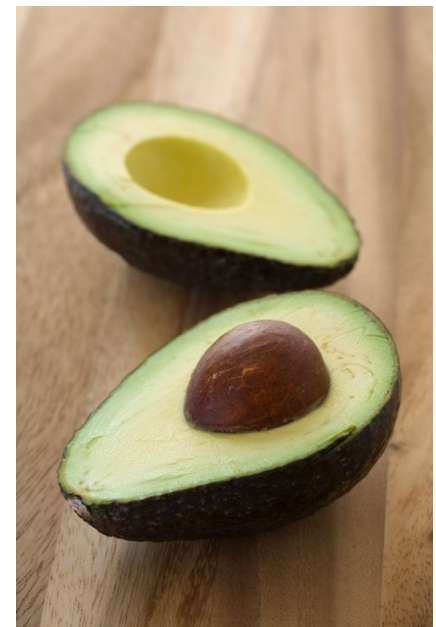
- **Carbohydrate (CHO) is the preferred and first energy source for strength training**
- **50-70% of daily energy intakes should come from CHO-rich foods**
- **CHO needs range from 2.5 to 4 grams per pound of body weight/day**



Other Dietary Rules



- **Less than 35% of energy should come from fat**
- **Less than 10% of the fat should come from saturated fat**
- **Vitamin and mineral needs are being met when daily energy sources come from a variety of foods**





Preventing Protein Breakdown



- **Ensure adequate energy and nutrient intake**
- **Balance amounts of CHO, protein and fat**
- **Ingest a CHO and protein source:**
 - **Containing 50 grams CHO and 12 gram protein**
 - **Within 45 minutes after strength training**
 - **To maintain and promote muscle mass**

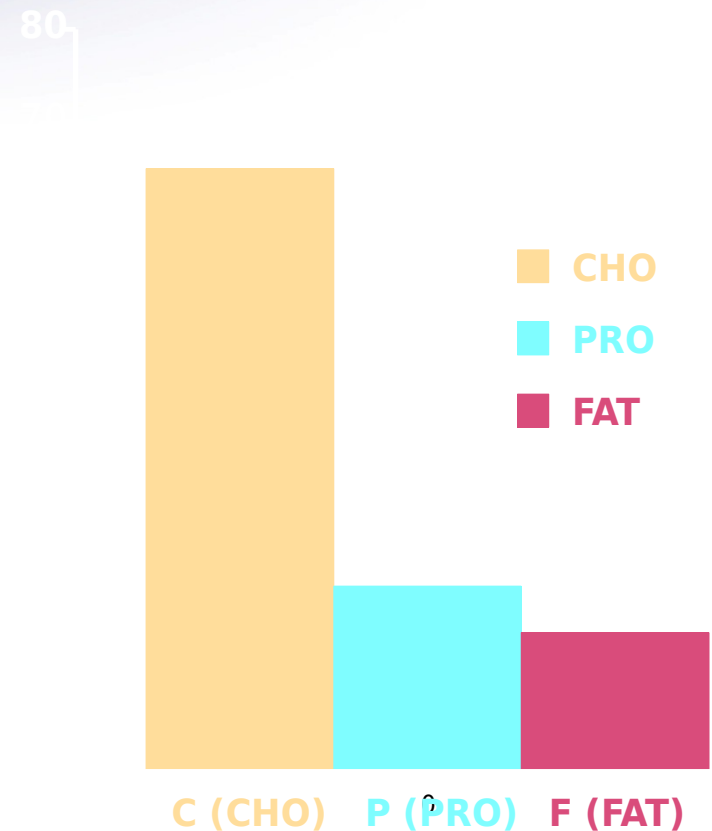




Nutritional Tips for Bulking Up



- **Break for Breakfast**
- **Graze throughout the day**
- **Eat every 30 to 60 grams of CHO every 3-4 hours, while awake**
- **Include CHO, protein and fat in all meals (*CPF meal plan*)**

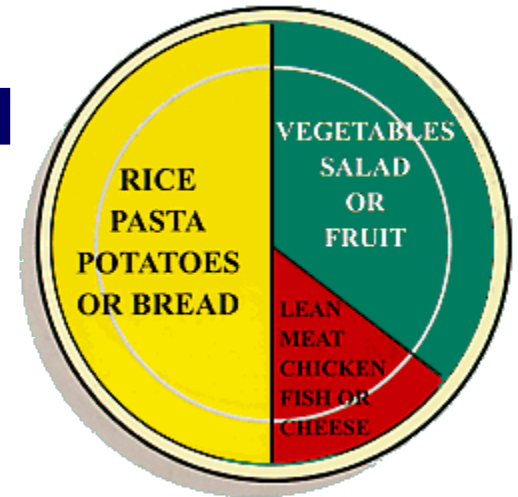




CHO-Protein-Fat Meal Planning



- **Fish, rice and vegetables**
- **Cereal, milk and fruit**
- **Turkey on whole grain bread with vegetables**
- **Low-fat yogurt, grape nuts and fruit**
- **Vegetable burrito: tortilla, vegetables and cheese**





Nutritional Tips for Bulking Up



- **Eat at least 3 of 5 food groups at every meal:**
 - **Grains**
 - **Fruits**
 - **Vegetables**
 - **Dairy**
 - **Meat, poultry, fish**
- **Avoid amino acid supplements and protein powders**



Key Points



- **Building strength and muscle mass requires:**
 - Consistent strength training, adequate rest, and a balanced diet
 - No more than 1 gram of protein per pound of body weight is required each day
- **Eating a variety of foods so that energy intake matches energy output will ensure optimal nutrition for building muscle**

